REMARKS

This Amendment is responsive to the Office Action dated March 24, 2004. In that Action, the Examiner rejected claims 1-7 and 10-36 were rejected under 35 U.S.C. §102(b) as being anticipated by Guo. Claims 8, 9 and 37-39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Guo. Applicant respectfully traverses the Examiner's rejection of the claims and offers the foregoing amendments and following remarks in support thereof.

Claim 25 has been cancelled without prejudice. Claims 1, 4-7, 12, 14, 16, 18, 20-22, 26, 33 and 36-38 have been amended. No new matter has been inserted. Claims 1-24 and 26-38 remain pending in the application. Applicant respectfully requests reconsideration of the Examiner's rejections.

As to the rejections based on Guo, some significant differences include that (a) the Guo invention can be used for imaging only, not also therapy as claimed by Applicant in certain claims. "Therapy" is distinguishable from "diagnosis". "Diagnosis" refers to determining the type and extent of a disease or condition, while "therapeutics" refers to the treatment or cure of the disease or condition. The structure of Applicant's invention allows Applicant's claimed invention to serve both purposes. Whereas, the Guo invention cannot be used for therapy purposes; and (b) Guo specifies (col. 16 lines 23-48) an antenna that provides a near-planewave beam pattern at a fixed frequency or at swept frequencies. Guo also specifies a single movable transmitting antenna as a substitute for the subarray. However, Guo fails to disclose transmitting multiple different frequencies at the same time in their single beam system as claimed by Applicant. Guo also fails to disclose transmitting crossed beams at a single or swept frequency or crossed beams at different frequencies as also claimed

by Applicant. Guo merely operates one frequency at a time from one signal source transmitter. Though Guo can sweep the frequency over time, at any given time, a spectrum analyzer in their machine would only show one peak. Applicant's claimed invention simultaneously transmits multiple different frequencies, something that is not disclosed or taught by Guo.

Several advantages can be achieved through the use of Applicant's claimed invention through its ability to simultaneously transmit multiple different frequencies. Without limitation, these advantages include:

1) if the internals of the body (or other device under test or interrogation) represent a linear medium, then the use of two frequencies allows one to impose both frequencies at once whether for diagnostic or therapeutic purpose. This imposes the difference (beat) frequency on the selected region of the internals (with or without nonlinearity). Additionally, most physical processes are nonlinear in some regime or another, including interactions of RF with tissue in the body. Applicant's claimed invention provides differences and sums and possibly maybe all kinds of harmonics too. These extra frequencies should likely provide a therapeutic handle on some pathologic conditions of the irradiated tissue. Thus, the claimed invention provides a process of multiple frequency RF irradiation (from the same direction or from multiple directions) in order to have the combination be useful for diagnosis and therapeutic treatment of a condition.

As an example, particular molecule occurs locally in the body or a contrast medium is injected which is taken up by the affected region. The molecule has an RF absorption at a certain frequency which is not transmitted through surrounding structures. Applicant's claimed invention allows the use of simultaneously transmitted two beams or one beam with two simultaneously

transmitted different frequencies to penetrate the structures and illuminate the volume of tissue in question. The absorption would affect the transmission of both beams as detected by the scanned or fixed detector. This allows Applicant's claimed invention to see things not viewable by Guo.

Another use example includes the ability to put an RF signal at a location where a single frequency machine (Guo) cannot to look up nuclear quadrupole resonance "NQR" such as for detection of explosives (looking for nitrate groups in the RF). The claimed invention crosses the two beams (or multiple frequencies for one beam) of localizable microwaves whose difference frequency can be the NQR frequency of the explosive.

2) Guo fails to disclose using multiple differing frequencies at the same time. In Guo you either scan spatially at one frequency and then change frequency and scan again, or you start fixed in angle, sweep frequency, then change angle and sweep again and so on.

Additionally, Applicant claims an "X-ray" absorption map (X-Y space or tomographic) for straight line attenuation of the incident beam. Guo fails to disclose this feature. Guo discloses computer processes using scattering matrix or generates data representative of a three dimensional profile. Applicant's claimed invention provides a two-dimensional map, which is not addressed by Guo.

As to claim 2 (Office Action Paragraph 9), Guo fails to discuss "train of pulses" as cited by the Examiner. The particular citation, is specifically discussing the tradeoffs of sweeping the frequency of the incident wave in comparison to changing incident directions. The discussion and Figure 6 illustration does not disclose pulse trains.

As to claim 4 (Office Action Paragraph 11), Applicant respectfully submits that the "size of the k-space ring" shows the

frequency of the wave, not the time at which it was sent. The citation to Guo is specifically referring to the tradeoff of frequency sweeping versus angular scanning of incident direction.

Furthermore, Guo's device will not work with simultaneous beams from different directions, since each receiving antenna of Guo will receive the sum of the scattered radiation from all the incident beams, and Guo cannot sort the individual contributions out. Thus, Guo is not talking about multiple simultaneous beams.

As to Fig. 7 of Guo, there is not any "measurement intersections" in such figure. Rather, there are four sets of circles, each circle is of a diameter set by the incident beam frequency, and the four groups (along the north, south east and west directions) correspond to the direction of the incident wave. The process for Guo sets the incident antenna to a direction (i.e. sending the incident power to the east, and sets the frequency to some value. It is then seen the scattered waves at that frequency over the array of receiving antennas (and this generates the one specific circle on the diagram for that direction and frequency). Afterwards, the frequency is changed to get another circle in k-space, etc.

Also, a continuous circle is not obtained by the Guo method, but a discrete set of points in k-space, basically disposed on a circle (since they do not have a continuously scanned antenna, but a set of discrete antennae). These circles are not data, but a schematic of the k-values available to the Guo technique, not necessarily used by the technique. The circles shown are obtained one at a time (the incident direction as called out by Guo is used one at a time). The intersections of the circles do not have any particular significance to either method of Guo, and Guo is inherently one direction (for the incident beam) at a time. Guo does not transmit two incident beams at a time, since this would

confuse the detector antennas.

As to Claim 6, Guo is inherently in cylindrical geometry, while Applicant claims an x-y scan.

As to claim 10 (Office Action Paragraph 15), the referenced section in Guo (col. 11, lines 38-58) does not talk about antennas at all, but about condition numbers and ways to stabilize the inverse scattering problem for their invention.

As to claim 13 (Office Action Paragraph 18), Figures 4-7 of Guo have absolutely nothing to do with spherical, or any other type, of wavefront. The circles in these figures do not show spherical wavefronts. Rather what is shown is a sphere of radius ksubm in k-space, not the space of places. In fact Guo at col.14, lines 53 and 54, explicitly states that they are using a planewave ("incident wave exp(i*ksubm*x", which is the math specification of a plane wave in the x direction).

As to claims 14 and 15 (Office Action Paragraph 19), Guo does not disclose that the distribution of electric permittivity of each receiver cell is a measured ratio of anything. The permittivity map that Guo is trying to get is not the permittivity of, or even at, the cells in their array. Rather it is the permittivity of the target or subject or object under test.

As to claim 18 (Office Action Paragraph 21), Guo does not look at a different frequency from the excitation. Applicant's claimed invention can tune the incident frequency to a resonance of some sort and look at the same resonant frequency, as well as the idea of exciting at one or more frequencies, then looking at a different frequency. Guo is not looking for resonances, and is certainly not looking for interaction frequencies. By saying a frequency caused by an interaction, Applicant is referring to a different frequency.

As to claim 19 (Office Action Paragraph 22), as mentioned above, therapy is not diagnostics. Applicant's claimed invention

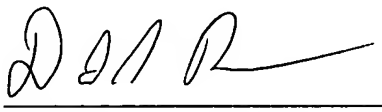
may treat diseases, not just detect them, since the method involves two or more simultaneous frequencies.

In view of the above, Applicant respectfully requests that the Examiner withdraw the Section 102 and 103 rejections based on Guo.

Applicant has completely responded to the Office Action dated March 24, 2004. Favorable action is respectfully requested.

Any additional charges, including Extensions of Time, please bill our Deposit Account No. 503180.

Respectfully submitted,



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